REMARKS

Applicants thank the Examiner for the first examination of the instant application. Claims 1-10 are currently pending in the instant application. Independent claim 1 has been amended by way of this Amendment. Reconsideration of application, as amended, is respectfully requested.

CLAIM OBJECTION

Claims 1-10 stand objected to by the Examiner. In particular, the Examiner objects the recitation "amplituded-modulated manner," set forth in independent claim 1. This Amendment is removes the objected to the subject matter from independent claim 1. Accordingly, Applicants respectfully submit that the claim objection is now moot. Applicants respectfully request reconsideration and withdrawal of the claim objection.

DRAWINGS OBJECTION

The drawings stand objected to under 37 C.F.R. 1.83(a). In particular, the Examiner maintains that specific recitation of independent claim 1 is not shown in the figures. The Examiner refers the recitation "simultaneously driving a modulatable heat source with at least two predetermined discrete different frequencies in an amplituded-modulated manner." This recitation of independent claim 1 is fully supported by the disclosure found on page 4, lines 25-31 of the Substitute Specification. The subject matter discussed in this portion of the description is properly illustrated in Figure 1 of the drawings. Accordingly, Applicants respectfully submit that the drawings are in full conformance with 37 C.F.R. 1.83(a). Therefore, the Examiner is respectfully requested to reconsider and withdraw the drawings objection.

REJECTION UNDER 35 U.S.C. § 103(A)

Claims 1-3, 5 and 7-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Egee et al., U.S. Patent No. 4,875,175 in view of Geiler et al., U.S. No. 5,206,710. In addition, Claims 4 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Egee et al. and Geiler et al., and further in view of Rosencwaig, U.S. Patent No. 4,513,384. These rejections are respectfully traversed.

Independent claim 1 sets forth a combination of limitations including "simultaneously driving a modulatable heat source with at least two predetermined discrete and differently modulated frequencies, thereby periodically heating said layer structures; [and] receiving infrared radiation emitted by said layer structure that is correspondingly modulated in intensity." Applicants respectfully submit, for the following reasons, that the patent documents relied upon by the Examiner either in combination together or standing alone fail to teach or suggest at least these limitations of independent claim 1.

As indicated hereinabove, the primary patent document relied upon by the Examiner is Egee et al. Egee et al. teach a method and device for analyzing and measuring physical parameters of a layered material by way of thermal radiometry. The Examiner asserts that Egee et al. teach each and every limitation of independent claim 1 except for simultaneous modulating of the flux of the thermal energy from the heat source by driving the heat source with two predetermined discrete frequencies. (See page 4, first full paragraph, of the current Office Action.)

Generally speaking, the device the method according to Egee et al. teach the determination of a thickness d of a material based on absorptivity B and diffusivity A parameters. Moreover,

the parameter of thermal resistance R may also be used in order to aid the determination of the thickness d.

Although Egee et al. makes a brief reference to the possibility that a material may be excited by way of simultaneous modulation of amplitude energy, further details as to how the simultaneous excitation takes place are not provided. Instead, Egee et al. focus on successive modulation of a low modulation frequency and then a high modulation frequency (fg, fh). In addition, Egee et al. is completely silent regarding the subject matter of receiving infrared radiation emitted by a layer structure that is correspondently modulated in intensity. The Examiner states that such subject matter may be found on column 2, lines 19-24 and lines 30-34; however, Applicants have carefully considered this specific disclosure and find no reference of discloser relating to receiving infrared radiation. Therefore, the Egee et al. disclosure fails to approach that which is set forth in independent claim 1.

Geiler et al. teach a method in apparatus for thermowave analysis. As is illustrated in Figure 1, the apparatus according to Geiler et al. includes a laser source 1 that receives frequencies f_1 and f_2. These frequencies f_1 and f_2 are used during the thermowave analysis process. Further discussion in the Geiler et al. patent document related to frequencies f_1 and f_2 is not provided. The patent document fails to teach or suggest "simultaneously driving a modulatable heat source with at least two predetermined discrete and differently modulated frequencies, therefore by periodically heating said layer structure; [and] receiving infrared radiation emitted by said layer structure that is correspondingly in intensity." Therefore, Geiler et al. fail to solve the deficiencies of the Egee et al. patent document, with respect to subject matter set forth in independent claim 1.

With regard to the Rosencwaig patent document relied upon by the Examiner, Applicants respectfully submit from even a cursory review of this document, it is clear that the disclosure thereof fail to solve the deficiencies of Egee et al. and Geiler et al., as discussed hereinabove.

In view of the above amendments and remarks, Applicants respectfully submit that independent claim 1 is allowable over Egee et al., Geiler et al., and Rosencwaig, whether these patent documents are relied upon standing alone or in combination together. With regard to the rejected dependent claims, Applicants respectfully submit that these claims are allowable at least due to their dependence upon an allowable independent claim. Accordingly, Applicants respectfully request reconsideration and withdrawal of the claims rejections under 35 U.S.C. § 103(a).

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite the prosecution of this application, the Examiner is invited to telephone Timothy R. Wyckoff (Reg. No. 46,175) at (703) 390-3030 in the Washington D.C. area.

Prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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VERSION OF MARKED-UP CHANGES

IN THE CLAIMS

The following claim has been amended.

1. (Twice Amended) A thermal wave measuring method for contact-free measurement of geometrical or thermal features of a layer structure, comprising the steps of:

simultaneously driving a modulatable heat source with at least two predetermined discrete [different] and differently modulated frequencies [in an amplituded-modulated manner], thereby periodically heating said layer structure;

receiving infrared radiation emitted by said layer structure that is correspondingly modulated in intensity; and

evaluating said received infrared radiation as a function of a drive frequency on the basis of amplitude or phase by simultaneously interpreting corresponding drive frequencies.